

**Monthly Progress Report**  
**Corrective Measures Study (CMS) for Potential Release Site (PRS) 16-021(c)**  
**January 2001**

This report summarizes Los Alamos National Laboratory (LANL) activities completed during January of fiscal year (FY) 2001 on the CMS for PRS 16-021(c), the 260 outfall. Both the activities described in the CMS plan ([LA-UR-98-3918]), which was submitted to the New Mexico Environment Department-Hazardous Waste Bureau [NMED-HWB] on 9/30/98, and approved by NMED-HWB on 9/8/99), and other related activities are described herein.

**Description of Activities and Contacts**

*High Performing Team (HPT) Activities* – The 260 HPT met on January 8, 2000.

LANL representatives provided an update on December activities including the hydrogeologic studies, the bench and pilot studies, and the IM investigations. A series of photographs from the TA-16-260 Interim Measure fieldwork were presented. Details are provided below in the sections of this monthly report covering these studies.

Stable isotope and spring flow-rate results were presented to the HPT by Brent Newman (LANL). This presentation represents the on-going evaluation of CMS data prescribed in the CMS Plan. Results included: 1) pore-water data from the intermediate depth boreholes, which suggests that the TA-16 mesatop ponds are a significant water source to the subsurface system; 2) data from the springs that supports a hydrologic conceptual model in which the majority of recharge is east of the Pajarito fault zone on the TA-16 mesatop; and 3) time series analyses of spring flow data that suggests that 4-5 modes control the hydrologic variability of the springs. These spring-flow data will be extremely useful for developing a monitoring plan for the springs. LANL representatives presented options for decreasing the scope of the isotope studies, focusing on reducing sampling to one representative spring (Burning Ground) and continuing sampling the other springs and waters on a quarterly basis. NMED representatives requested an analysis of post-fire data to confirm that the pre-fire correlations between spring parameters are robust. However, they also suggested that LANL prepare a letter formally requesting this reduction in sampling.

The HPT continued discussions of waste treatment and disposal options for the IM. LANL personnel noted that the Lake Charles, Louisiana treatment, storage and disposal facility appears to be able to treat HE-contaminated soil using either the TOSS or W.R. Grace bioremediation processes, and that the costs of waste disposal at this facility are not unreasonable. The costs of permitting an on-site treatment unit were identified as a significant percentage of overall waste costs associated with treatment, if permitting is required. LANL inquired about likely post-closure requirements for a treatment unit. Temporary authorization was further discussed. LANL personnel will continue to discuss

the likely costs of pursuing on-site treatment options. NMED personnel will continue discussions of Temporary Authorization internally.

LANL provided the final draft revision of the engineering design for the Stormwater Management deployment.

LANL inquired about the draft IM Report outline. NMED indicated LANL should proceed with that outline. LANL noted the letter requesting reductions in CMS sampling would be arriving at NMED this week and that it was hoped that these reductions could be implemented in February.

The next meeting is scheduled for Monday February 5, 2001. Agenda items will include evaluations of CMS data, ecological risk, temporary authorization, and waste disposal options for the Interim Measure.

***RCRA Facility Investigation (RFI) Report and CMS Plan***– No new activities occurred during this reporting period.

***Best Management Practices (BMPs)***– BMPs are being inspected quarterly and following significant precipitation events inasmuch as IM fieldwork, including site restoration, is complete except for finalization of the zero-discharge dam. No BMP repairs were required this month.

***CMS Hydrogeologic Investigations***–CMS hydrogeologic investigations include ongoing Phase II RFI sampling as well as continuing investigations outlined in the CMS plan.

The ongoing Phase II RFI sampling program included collecting samples at Burning Ground, Sanitary Waste Consolidation System (SWSC) and Martin springs every other day for bromide, other anions, and stable isotopes. Data from the spring and well dataloggers was downloaded weekly. No new bromide breakthrough has been observed in samples to date. The flow in the springs and in Cañon de Valle decreased, where the sampling locations weren't frozen, during January.

The wells, both alluvial and deep, were checked weekly for both presence and level of water. All of the five alluvial wells in Canon de Valle and the three alluvial wells in Martin spring canyon contained water. The Canon de Valle hydrologic system appeared to be drying up following an October peak in saturation. Monthly and weekly flow-integrated samples were collected. Troubleshooting of the autosamplers continued.

Quarterly sampling of springs, alluvial wells, surface waters and other locales was completed. Frozen sampling localities (e.g. 90s Line Pond) were not sampled. An abbreviated suite of analytes had to be submitted from well 16-2657 and 16-6293 due to the small volumes of water present.

In January, 5 samples from precipitation events were collected and archived for analysis.

Quarterly sampling activities were completed at CdV-R-15-3. The uppermost three screens did not contain water, the lowermost three screens were sampled. Turbidity in the sampled screens was low (less than 5 N.T.U.).

### ***Ecological Risk Pilot–***

A draft plan for ecological data collection was reviewed internally. Results of the ecological risk pilot were presented at the ER Colloquium.

***CMS Bench and Pilot Studies***–Bench and pilot studies continued in collaboration with the Innovative Treatment Remediation Demonstration (ITRD) Program. The ITRD HE program is focused on two DOE sites: LANL and Pantex. Studies include:

1. A study of the passive barrier technology of Stormwater Management, Inc., which is potentially useful for removing HE and barium from waters.
2. A study of chemical treatment of HE-contaminated soil using zero-valent iron (ZVI). The LANL portion of this study has been completed.
3. A study of in situ anaerobic bioremediation of HE using gas-phase carbon additions.
4. A study of ex situ anaerobic bioremediation of HE-contaminated soils using the W. R. Grace process, which combines anaerobic bioremediation with a ZVI treatment. The LANL portion of this study has been completed.
5. A study of HE composting. Amendments appropriate to northern New Mexico were tested on both clean and contaminated soils. The LANL portion of this study has been completed.
6. A study of immobilization of barium-contaminated sediments from Cañon de Valle.
7. Phytoremediation studies in Cañon de Valle.
8. Oxidation, reduction, and in-situ bioremediation studies of groundwater contamination at Pantex.

An ITRD meeting focussed on Pantex Groundwater was held on January 23, 2000. Results from pilot studies being carried out at Pantex were reviewed. Both potassium permanganate oxidation of HE and molasses-enhanced anaerobic bioremediation lab-scale tests were successful at reducing HE levels in Pantex groundwater to below Texas risk reduction standards. An in-situ potassium permanganate push-pull test was also successful at reducing HE levels. A report on these tests entitled: “Implementation Report of Remediation Technology Screening and Treatability Testing of Possible Remediation Technologies for the Pantex perched Aquifer” was provided. Study designs for further tests of oxidation, reduction, and bioremediation were developed.

### ***Interim Measure (IM) –***

Activities at the TA-16-260 IM were limited. Site restoration activities are complete except for capping of the zero discharge dam. This activity will be completed following spring snowmelt.

The interim measures report was started by the field work contractor.

***Public and Stakeholder Involvement***– No activities during this reporting period.

### **Percentage of CMS Completed**

LANL estimates 71 % of the CMS has been completed to date. Note that this percentage does not reflect the deep wells that will be drilled per the CMS plan addendum.

### **Problems Encountered/Actions to Rectify Problems**

*General Problem (1)* The Cerro Grande fire has severely impacted the 260 RFI/CMS activities. These problems have been discussed in detail in previous monthly reports.

*Action to Rectify General Problem (1):* LANL will work closely with NMED through the HPT to mitigate the effects of the Cerro Grande fire.

### ***CMS Hydrogeologic Investigations***

*Problem (1):* Questions relating to the quality of data from well R-25 remains a concern to the TA-16-260 team.

*Action to Rectify Problem (1):* LANL will evaluate the data from the quarterly sampling of the R-25 well to evaluate its reliability.

*Problem (2)* The autosamplers in the three springs have operated poorly since the Cerro Grande fire including in January.

*Action to Rectify Problem (2):* The IT field team maintains the autosamplers as needed. These problems are currently handled during a sampling period by intensively managing the samplers manually. Solutions to the technical problems are being pursued.

### ***CMS Bench and Pilot Studies***

None.

### ***IM***

None.

### **Key Personnel Issues**

None.

## **Projected Work for February 2001**

### ***RFI Report and CMS Plan***

- No work is scheduled for this month.

### ***BMPs***

- Inspection of existing BMPs following significant precipitation events will continue.

### ***CMS Hydrogeologic Investigations***

- Maintenance of autosamplers
- Continued bromide sampling of springs
- Checking for levels and presence of water in alluvial and deep wells.
- Sampling of flow-integrated autosamplers
- Continued precipitation monitoring and sampling for stable isotopes.
- Data analysis
- Update of site-specific health and safety plan for hydrogeologic activities

### ***Ecological Risk Pilot***

- The ecorisk team will present the study design for ecorisk sampling to the HPT.

### ***CMS Bench and Pilot Studies***

- Preparation for deployment of Stormwater Management units
- Completion of site-specific health and safety plan for Stormwater Management unit deployment

### ***IM***

- Data analysis and writing of IM Report

- Waste management

***Public and Stakeholder Involvement***

No activities planned.